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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/710,661	07/27/2004	Yoshiki Okayama	018.0059	4660

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EXAMINER	
PILKINGTON, JAMES	
ART UNIT	**PAPER NUMBER**
3682	

MAIL DATE	DELIVERY MODE
10/15/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/710,661	OKAYAMA, YOSHIKI	
	Examiner	Art Unit	
	James Pilkington	3682	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *7/27/04* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/16/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, R_2, the thickness of the sleeve (t_1) and the thickness of the hub (t_2) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:

- Paragraph 11 line 6 "andif" should be - - and if- -
- Paragraph 38 line 24 "31band" should be - -31b and- -
- Paragraph 38 line 30 "ofmagnetic" should be - - of magnetic- -
- Paragraph 39 line 11-12 "thestatinary" should be - -the stationary- -

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2, 4 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 2, 4 and 6 it is not clear where the dimensions of R_2, t_1 and t_2 are being measured from to satisfy the conditions found in equations 1 and 2. For example, is t_2 being measured at the top of the hub near 31b, along the middle portion, at 31a or at the location of the magnet?

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komura et al, USP 6,771,459, in view of Ishikawa et al, US PGPub 2002/0186903, and further in view of Gomyo et al, USP 6,834,996.

Regarding claims 1, 3 and 5, Komura discloses:

- A housing (13, hard drive case)
- A motor (102) for spinning recording disk (116) fixed inside of the housing (13)
- A data access means (C1/L45-50)
- The motor (102) comprising:
    - A shaft (132)
    - A sleeve (134)
    - A mirco-gap (space between 132 and 134, see Figure 4)
    - A substantially cylindrical hub (114) which applies a surface pressure to an outer side of the sleeve (134)
    - A gas dynamic pressure bearing (130) in which a pressure generating groove (C5/L26-30) is formed on at least one of the outer peripheral surface of the shaft (132) and the inner peripheral surface of the sleeve (134)
    - A bracket (104) for fixing the shaft (132)
    - A stator (118/120) mounted on the bracket (104)
    - A magnet (122) mounted on the hub (114)

- The shaft (132) and the sleeve (134) are made of ceramic (C4/L54-57 and C5/L31-41)

Komura does not disclose that the shaft and the sleeve are made of alumina (Al_2O_3) and that the shaft is further sintered with titanium carbide (TiC).

Ishikawa teaches a shaft (14) and a sleeve (15) which are made of an alumina ceramic for the purpose providing a bearing which has excellent wear resistance (paragraph 0027 lines 9-10). Ishikawa further teaches that the shaft (14) may be sintered with titanium carbide (paragraph 0026 and 0066) for the purpose of increasing the strength of the ceramic (paragraph 0026).

Komura does not disclose that the hub is made of ferrite stainless steel.

Gomyo discloses that ferrite stainless steel can be used to manufacture the hub (C1/L60-63) for the purpose of reducing manufacturing cost (ferrite steel is the least costly to manufacture) and provide a part that is highly resistant to stress corrosion.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Komura to provide a shaft made of alumina ceramic sintered with titanium carbide (Al_2O_3-TiC) to provide a shaft that is highly wear resistant and as an increased strength and a sleeve made of alumina ceramic (Al_2O_3) so as to have excellent wear resistant, as taught by Ishikawa. In addition, a hub made of ferrite stainless steel, as taught by Gomyo, for the purpose reducing manufacturing cost and

provide a part that is highly resistant to stress corrosion. This material combination results in a device having coefficients of expansion as follows: sleeve < shaft < hub.

Regarding claims 2, 4 and 6, Komura in view of Ishikawa and Gomyo do not disclose that the device satisfies the equations $2R_2\Delta T(\alpha_2-\alpha_1)<\delta$ and $t_2/t_1>0.25$.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use values in the range of the equations, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Pilkington whose telephone number is (571) 272-5052. The examiner can normally be reached on Monday-Friday 8:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571) 272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JP
10/9/07

Thomas R. Hannon
Primary Examiner